REMARKS

1. Applicant submits amended Fig. 2C. Said figure has been amended to correct obvious errors.
   a. The present US application evolves from PCT application No. PCT/IL2003/001092 and claims priority from IL Application No. 153535. It has now been found that during the preparation for said PCT filing, a corruption has occurred in Fig. 2C. A copy of Fig. 2C of priority application is enclosed as an Annotated Sheet for easy verification of the incorporation by priority reference into the Replacement Sheet for Fig. 2C.
   b. In Fig. 2C a corruption to the original Fig. 2C has occurred: For example, the distance L is not at all limited at its left side, there are 3 terrain points at the upper right side of the Figure that are obviously out of the terrain line, the lines 207 and 208 are obviously out of their supposed locations, as they continue beyond the terrain, and more. A corrected Figure 2C, which is exactly the same as of Fig. 2C of the priority application is now submitted, to replace said corrupted Fig. 2C.

2. Applicant submits amendments to the set of claims. Independent claim 1 has been amended in order to better define the essence of the invention, and it has also been merged with present claim 7. Claim 7 has been cancelled.
3. Claims 21 to 40 have also been cancelled.
4. Claim 19 has been amended in order to attend the Examiner comment on page 5 second paragraph of the Office Action. In this respect, it should be noted again that claim 39 has been cancelled.

5. New claims 41 to 51 have been added.
6. Several other amendments have been made for the sake of clarity, consistency, and in order to better define the present invention.

The Examiner has rejected claims 1-40 based on 35 U.S.C. 101, as the claimed invention is directed to a non-statutory subject matter, and as the invention as claimed lacks patentable utility.

Initially, it should be noted that the corrected Fig. 2C significantly clarifies the invention. Applicant believes that at least some of the Examiner's objections evolve from the inaccuracy of this figure.

Applicant has also amended independent claim 1, which now relates to a method for producing a compact size Digital Terrain Model (DTMO). As discussed in the "Background of the Invention" pages 1-3, digital terrain models are widely used by aircrafts or ground vehicles (both will be referred to hereinafter as "vehicle"), for planning in real time (or off line) a suitable approach route to a destination. Such a planning of the route must take into account the factor of when and where the vehicle is exposed to one or more terrain locations, or more particularly, when and where there is a direct line of sight between specific terrain locations and the vehicle. As also said in the application, such lines of sight calculations with respect to a terrain area which is represented by a Digital Elevation Terrain Data (DETD) is very complicated and involves many calculations as it involves very large amount of digital data, and processing with respect to very many points within the area of the DTED. This problem becomes even much more significant

when the calculations have to be made in real time. Therefore, DTMOs of the prior art are generally do not, or only hardly applicable for real time use. Claim 1 as now drafted relates to a method for forming a pre-calculated DTMO which is compact in term of its data size, and therefore can be searched, used and processed much faster, and claim 41 relates to a structure of a compact size DTMO.

The invention as claimed by amended claims 1 and 41 as now amended do not relate merely to an algorithm. The invention relates to a method for producing a DTMO, and to the DTMO structure that, as indicated in the application and claims can be implemented in the real physical world, for example, in association with an aircraft or a ground vehicle and it can produce a real result, as the model provided by the invention enables a compact size model, which can be interrogated by the vehicle much faster and with less computations, and can therefore be used in real time applications. In view of the above, Applicant believes that claims 1 and claim 41 relate to patentable subject matter.

The Examiner also rejects claims 1 to 40 under 35 U.S.C. 112, second paragraph, as being indefinite. For the same reasons as discussed above, amended claim 1 relates to a method for producing a compact size DTMO, and new claim 41 relates to the structure of said compact size DTMO. As said in the application (for example, pages 1-3), DTMOs are widely used in the art. Therefore, the present invention introduces a useful and practical implementation.

The Examiner also rejects claims 1 to 40 under 35 U.S.C. 112, first paragraph, for failing to comply with the enablement requirement. An important aspect of the present invention is the pre-calculation of directional fans data sets with respect selected source points of

the terrain, where each fan data set comprises a data set of exposable heights for each selected angular direction. Each such data set of exposable heights which relates to a specific azimuth direction reduces the amount of information within the model as it includes data which relates only to exposed terrain points, and it ignores data relating to terrain points that are hidden (see claim 1). The result is a compact size model, which includes less pre-calculated information, which however, does not affect the accuracy of calculation, when enquiries are submitted to it. Claim 9 describes a method of compression, which further reduces the size of the model of claim 1. The result is a pre-calculated model, whose size is significantly reduced, and which significantly reduces the required interaction in order to obtain from it exposability data. On the other hand, in the models of the prior art the exposability calculations have to be made with respect to all, or a very high number of points of the terrain of interest, and moreover, without said pre-calculation they are much more complicated. Therefore, while the model of the invention is simple, and therefore can be optimally operate in real time inquiries, the models of the prior art are not optimized for such a real time operation. The description, including corrected Fig. 3C, clearly supports the steps of amended claim 1, and the structure of the DTMO as claimed in claim 41, and also provides examples for the use of the DTMO for off line planning queries, on-line planning queries, handling uncertainty issues, forming various types of DTMOs such as a communication DTMO, and exposability DTMO, etc. Therefore, Applicant believes that the enablement is met by the present description.

The Examiner rejects claims 1-6, 18, 21-26, and 37-40 under 35 U.S.C. 103(a) as being unpatentable over Kershner et. al. (5,838,262). The Examiner has not rejected claim 7. Claim 1 has now been amended to include all the features of claim 7.

The system of Kershner "...is further operative to generate three-dimensional threat envelopes of identified threat systems and to display real-time perspective video images of such three dimensional threat envelopes for viewing by the pilot" (see abstract). More particularly, in similarity with the present invention, Kershner is aware of the problem of calculating in real time those locations in which the vehicle is exposed to terrain points or terrain areas (i.e., those locations having a direct line of sight with terrain points or terrain areas) and those which are not. Therefore, in similarity with the approach taken by the present invention, Kershner also suggests pre-calculation relating to lines of site with respect to specific threat points of the terrain. The threat points of Kershner may be considered as equivalent to the source points of the present invention. However, the result of the calculation of Kershner is a three-dimensional image such as the image shown in his Fig. 11. When approaching the threat, the pre-calculated three dimensional image is displayed to the pilot, enabling him to know where he is exposed and where he is not. For that purpose, and for dynamically displaying this three dimensional model to the pilot as the aircraft location varies, Kershner's system uses a "...dedicated special purpose microprocessor 106 for generating three-dimensional geometric figures such as the "geometry engine" marketed by Silicon Graphics..." (col. 8, line 15+, and also in col. 19, 57+). Kershner's invention applies such a strong and dedicated purpose processor to solve this problem. The present invention on the other hand uses another approach. It produces a simplified, and reduced size pre-calculated model, which enables very fast inquiries to the model to take place, and the obtaining of the results in real-time, in view of the significant reduction of the model size and in view of the simplification of the model. Kershner never proposes the simplification and reduction of the model size.

Therefore, Applicant believes that the present invention is novel and inventive over Kershner.

Reconsideration and allowance are, therefore, requested.

Respectfully submitted,

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